ATTACHMENT 2

SYSTRAN II

WORLD TRANSLATION COMPANY OF CANADA LIMITED
SUITE 740, 220 LAURIER AVENUE WEST
OTTAWA, ONTARIO, CANADA K1P 5Z9
TEL (613) 563-0137 TELEX 053-4836

C05

19 October 1982

The Director
Central Intelligence Agency
Langley, Virginia
U.S.A.

Dear Sir:

I am writing to advise you of certain facts relating to a computer software system for the translation of natural languages, that was developed for the Foreign Technology Division of the United States Air Force. This system has recently been the subject of enquiries from a representative of the Soviet Union.

The Computer system (SYSTRAN) was developed for translation at extremely high speed between Russian and English, and, in addition to current use at Wright-Patterson Air Force Base in Dayton, Ohio, was used by NASA during the Apollo-Soyuz missions. (I am attaching an article from a NASA publication on this subject).

The SYSTRAN system was developed by Dr. Peter Toma, President of World Translation Center Inc (WTC Inc) of La Jolla, California, and all work on the Russian system outside of the Foreign Technology Division, is carried out at that location.

In 1977 this company purchased from WTC Inc the exclusive United States and Canadian marketing and usage rights to SYSTRAN for all language pairs. As you would expect, the commercial market for Russian language systems, is somewhat restricted and WTCC Ltd accordingly limited its efforts on translation from English into French, Spanish, German, Italian and Arabic. WTCC was able to license companies such as General Motors, Xerox, WANG, Bell and Digital Equipment for the use of the system for commercial translation. In May 1982 WTCC sold all of its marketing and usage rights for SYSTRAN outside of Canada, to Dr. Toma and a group of Japanese associates.

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In January of this year a Mr. Boris Antoniuk of the USSR Trade Council approached Mr. John Allen, who at that time, was managing our interests in the United States. I informed Mr. Allen that our company was not interested in any business with Mr. Antoniuk and his associates. I felt that the matter was closed until I was informed that a demonstration of the SYSTRAN system took place recently in the Soviet Union.

Shortly thereafter, I received a communication from WTC Inc in La Jolla, alleging that our company had provided a copy of the Russian Systran system to one of Dr. Toma's licensees, the SYSTRAN Institut, Wilhelm Hertz Strasse 12, 7000 Stuttgart 1, West Germany, and that this organization had been responsible for the commercial activities in the Soviet Union.

I would like to state unequivocally and for the record that:-

a) At no time has this company ever had in its possession a copy of any of the SYSTRAN systems concerned with Russian, nor any copies of the Russian dictionaries used with the system.

b) We did not, therefore, provide copies of any such Russian systems to the SYSTRAN Institut or any other third party.

c) To the best of our knowledge, the only copies of the Russian-English system existing outside of the control of the United States Air Force, are those in the possession of LATSEC Inc of La Jolla, California. Dr. Peter Toma is also President of LATSEC Inc.

If I can provide any further information on this matter, please feel free to contact me.

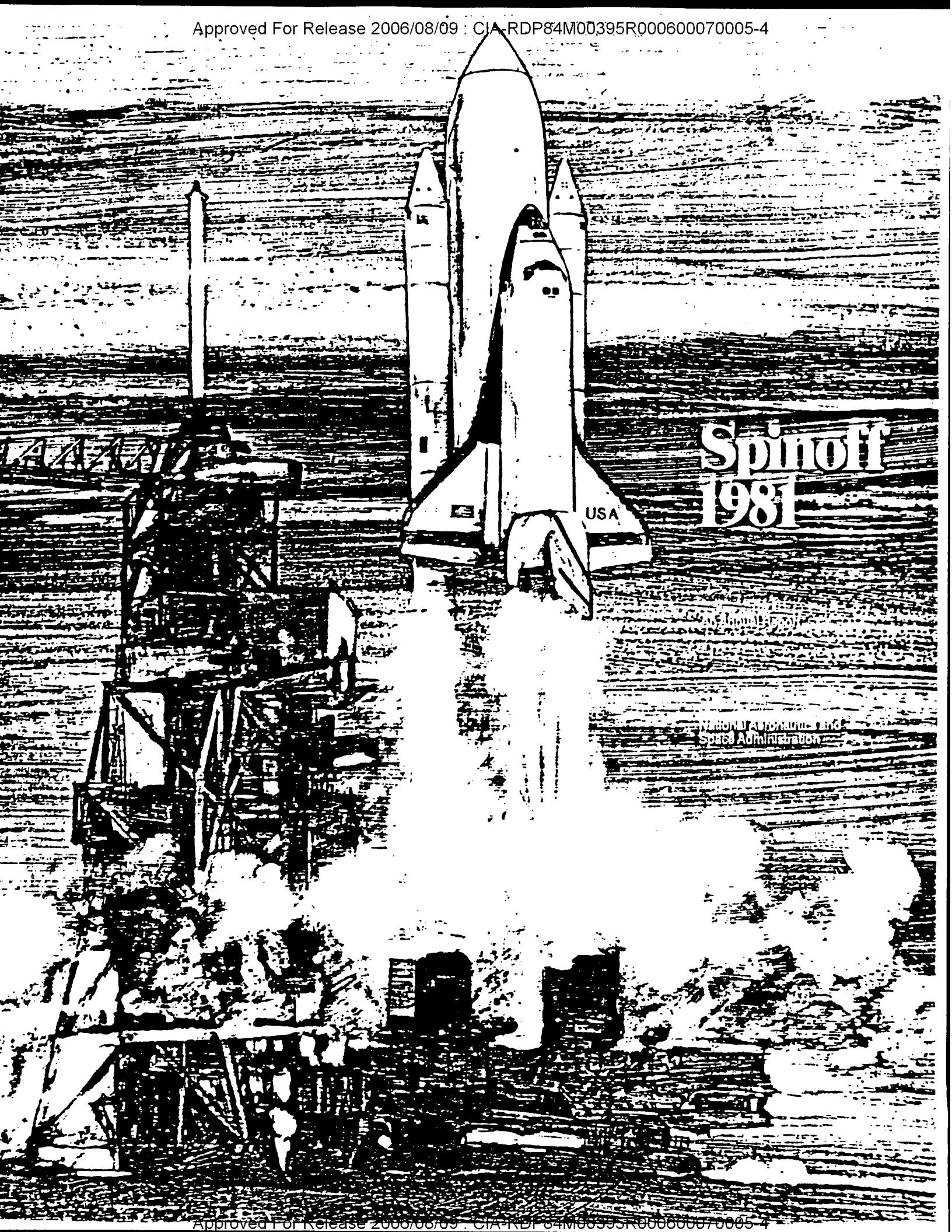
Yours faithfully,

David Burden
Senior Vice President

DB:ca

Encl.

cc: Mr. Bob Murray
McEachran & Associates

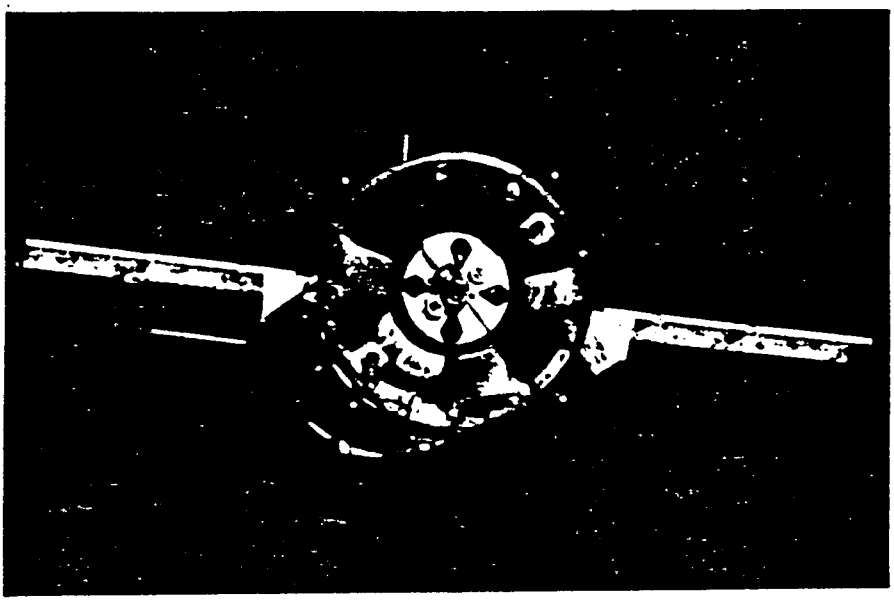


Spinoff 1981

National Aeronautics and Space Administration

Breaking the Language Barrier

Heading a group of technology transfers in the field of computer processing is a space-spurred electronic translation system



The spacecraft pictured is a Soviet Soyuz, photographed by an American Apollo crew as the two craft maneuvered toward a historic docking in orbit. Preparations for the mission entailed large-scale informational exchange, accomplished by a computerized translation system. Apollo-Soyuz thus provided impetus to development of a commercial machine translation system known as SYSTRAN II.

In the summer of 1975, an American Apollo and a Soviet Soyuz spacecraft docked in orbit, the first international space linkup. The mission—which proved highly successful—was intended as a first step in development of internationally compatible equipment and techniques, toward the day when spacecraft of any nation could dock together for operational or rescue purposes.

Apollo-Soyuz was a complex project that needed three years of preparation for study of the many Soviet/American differences in design and operational techniques, and for joint development of an airlock to allow the crews to move from one spacecraft to the other. For the benefit of astronauts, cosmonauts, scientists, engineers and ground controllers, each nation provided the other a voluminous library of technical literature —written, of course, in the language of origin. That posed a first class dilemma: there probably were not enough technically qualified translators in the world to convert the material from one language to the other in the allotted time.

Johnson Space Center (JSC) found a solution in the person of Dr. Peter Toma, president of LATSEC, Inc. and the World Translation Center, La Jolla, California. A pioneer in computerized language translation, Dr. Toma had earlier developed a basic software package—called SYSTRAN—and worked on a Russian-to-German translation system. He had also developed, for the U.S. Air Force, software for translating Russian into English.

Under JSC contract, Dr. Toma undertook development of a two-way software package—Russian to English and English to Russian—for Apollo-Soyuz. For the Russian to English translations, he was able to draw on the technology he had developed for the Air Force. Converting English to Russian, however, presented a formidable challenge. Russian is a "fully-inflected" language wherein word meanings are altered, in precise fashion, by the addition of prefixes, infixes and suffixes; parts of speech and the relationships between adjectives and the nouns they modify are virtually always clear. English is much more subtle; the meaning of a statement is influenced by the parts of a sentence preceding or following a particular word or phrase. Many

language experts had predicted that machine translations from English would be next to impossible.

Dr. Toma proved them wrong. His two-way Apollo-Soyuz software package was highly satisfactory and it contributed substantially to the success of the mission. His breakthrough in translating English to a fully-inflected language, coupled with the demonstration of software reliability in a large-scale project, spurred commercialization of machine translation.

One of Dr. Toma's first commercial customers was Xerox Corporation, Rochester, New York. Xerox markets its products internationally, thus needs translation of service manuals into several languages. Seeking to improve its competitive posture by reducing translation and printing time, Xerox contracted with Dr. Toma's World Translation Center for translation software. The company is currently making translations from English into French, Spanish, Italian and Portuguese and is planning expansion into other languages.

In 1976, Dr. Toma licensed World Translation Company of Canada (WTCC) Limited, Ottawa, Ontario to handle North American marketing and commercial support activities for the SYSTRAN system. WTCC was formed by a group of Canadian investors who saw a broad market for electronic translation in growing corporate multinationalism and in Canada's Official Languages Act, which requires publication of government and other documents in both French and English. Dr. Toma and WTCC still work together; the result of their collaboration is SYSTRAN II.

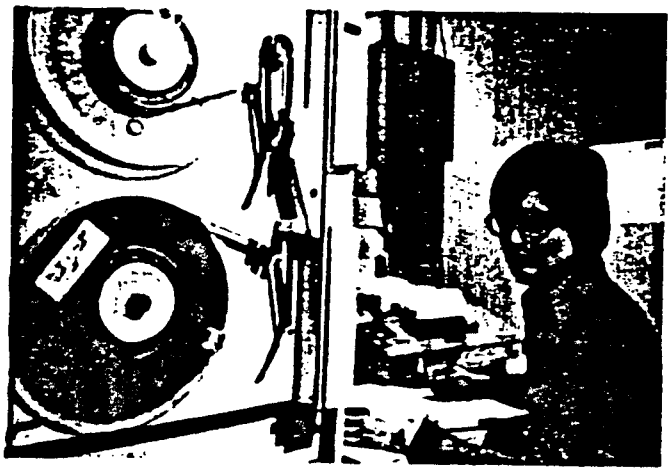
The key element of SYSTRAN II is a computer program—one of the longest ever written, with half a million lines of instructions—backed by a computerized dictionary which contains terminology, technical expressions, grammatical rules and semantic principles. The text to be translated is fed into the computer, which analyzes it for syntax and semantics, then produces—in printout form—an accurate version of the text in the target language. The computer's draft is refined by human translators, whose editing is also computerized. The system then produces a magnetic tape ready for photocomposition.

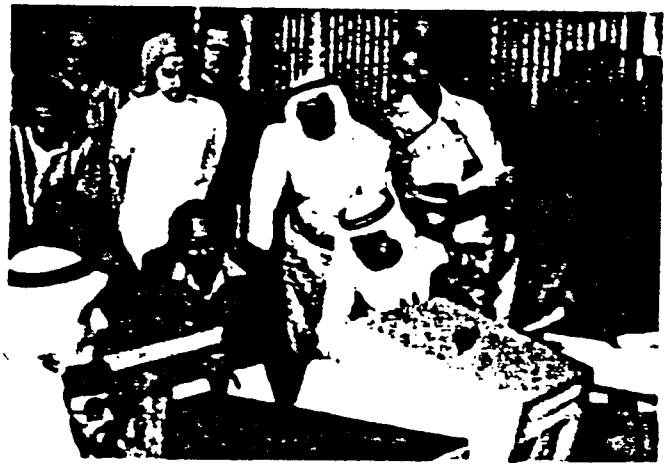
WTCC says that SYSTRAN II will generally increase the output of a human translator by five to eight times, thus affording significant cost savings by allowing a large increase in document production without hiring additional people. Extra savings accrue from automatic production of camera-ready copy.

SYSTRAN II applications include translation of service manuals, proposals and tenders, planning studies, catalogs, lists of parts and prices, textbooks, technical reports and education/training materials. The system is operational for six language pairs. In addition to Russian/English and English/Russian, they include translations from English to French, Spanish and Italian and from French to English. Six other pairs—English to German, Portuguese and Arabic, German to English, French and Spanish—have been successfully demonstrated and are being improved. Japanese to English and English to Japanese are in process of development.

Xerox Corporation's experience exemplifies the system's utility. Xerox, which has a 10-person translation group and a high annual volume of manual production, finds that its machine translations take only 20 percent of the time otherwise required, even with allowance for the time spent on human editing of the computer's draft. There is an additional saving in formatting time: the translated readout retains the indentations, paragraphing and other features of the input copy, hence—after editing—is ready for printing. In addition to Xerox, other major SYSTRAN users include General Motors of Canada, Bell Northern Research of Canada, the U.S. Air Force and the European Commission.

SYSTRAN II "reads" a document in one language and produces a printout in the target language. Using a computer terminal, a human translator (below) refines the printout. The end product is a translated and edited magnetic tape ready for printing.





At the University of Petroleum and Minerals in Saudi Arabia, David Burden (right), senior vice president of World Translation Company of Canada, demonstrates how SYSTRAN II can translate English language material into Arabic with accuracy, consistency and appreciable cost savings.

BACKGROUND

ATTACHMENT 3

1. The SYSTRAN system was developed by Dr. Peter Toma, President of LATSEC Inc., and of World Translation Center Inc (WTC), both of La Jolla, California. LATSEC, under contract with the U.S. Air Force's Foreign Technology Division (FTD), put into production in the 1960s the machine translation system presently used by FTD (but considerably modified during the ensuing years) for translation of Russian documents into English. [ ] 25X1

2. After considerable dispute between Dr. Toma and FTD concerning proprietary and marketing rights, it was agreed in 1974-75 that, since virtually all funding for the development of the Russian-English SYSTRAN system used by FTD had been funded by the U.S. Government, FTD could make the SYSTRAN system available to any other U.S. Government agency. Conversely, Dr. Toma was given the right to market that system commercially. [ ] 25X1

3. On 27 May 1982, Major General William H. Baumer (AUS Ret.) wrote to the DCI from La Jolla, California on behalf of LATSEC's SYSTRAN computerized language translation system. He pointed out that although he and Dr. Toma met several times with representatives of "CIA's FBIS" in 1975 and 1976, the talks did not result in any CIA use of LATSEC's translation services. Having reviewed the use of the SYSTRAN system by FTD and NASA as well as by the European Economic Community and various American business firms, Baumer advised the DCI that he and the technical people at LATSEC would be available for discussions with the Agency should the DCI wish. [ ] 25X1

4. On 18 June the DCI signed a letter to Baumer thanking him for the information concerning LATSEC and advising him that he had asked the Procurement Management Staff of the Office of Logistics to obtain from Baumer additional information regarding LATSEC's translating capabilities for distribution to Agency components requiring computerized translations. The DCI penned a note to the reply prepared for him by the Deputy Directorate for Administration, advising Baumer that if he or the LATSEC people should wish to discuss this matter with the Agency's Language training group, they would be welcome to do so. [ ] 25X1

5. On 25 June [ ], Chief of the Procurement Management Staff wrote Baumer and, with reference to the exchange of correspondence between him and the DCI, requested that Baumer provide any additional information concerning LATSEC's language translation capability to the Procurement Management Staff. [ ] concluded his letter by stating that "informal queries to requirements personnel have indicated that they are generally knowledgeable of the SYSTRAN capability and that there is no current requirement." [ ] 25X1 25X1 25X1

6. Although we are unaware of the exact relationship between General Baumer and LATSEC (employee or consultant) we have been advised by officers of both NSA and the Department of Defense who have long been involved in foreign language training and translation matters, that Baumer has been actively soliciting business for LATSEC's SYSTRAN system since the mid-1970s. [ ] 25X1

7. We have no information concerning Soviet interest in the SYSTRAN system except for Mr. Burden's letter. We feel that a short, simple acknowledgement to him is all that you should provide, but we wanted you to be fully aware of the background since this is not the only communication the Agency has received concerning SYSTRAN or LATSEC. [redacted] 25X1